Amphibious Ship Programs 21 May 2008

Amphibious Ship Programs Section

POE-50, PP&O

Maj Juan Ortiz, USMC

juan.m.ortiz@usmc.mil

Amphibious Ship

- Amphibious Lift – Shipbuilding Position
- Programs:
  - Current Ship Inventory
  - Big Deck Programs (LHD-8 / LHA-6 / Future Big Decks)
  - LPD-17
  - LSD
- Other Related:
  - Amphib OAG (3-5 Jun / Norfolk)
  - Ship Weight and Stability Working Group
  - Ship to Shore Connectors
  - Studies

Amphibious Ship – MPF(F) Shipbuilding Position

MROC DECISION MEMO 08-2007

- The Marine Corps operational lift requirement (minimum) is 2.0 amphibious MEB Assault Echelons and 1.0 MPF(F) and Legacy MPSRONs*.
- A total of 30 Operational Available (Ao) amphibious ships (i.e., 10 Ao LHD-1/LHA-6 Class Ships, 10 Ao LPD-17 Class Ships, and 10 Ao LSD 41/49 Class Ships) are required to support the 2 MEB Assault Echelon forcible entry force directed by the Strategic Planning Guidance (SPG). The actual number of fleet ships must be larger than 10-10-10, since not all ships will be operationally available at any one time. **Thus, 11-11-11 mix is the stated USMC position for amphibious ships.**

BASELINE MEB

AMPHIB LIFT

- **SO WHAT?**
  - **33 SHIPS GET YOU 30.**
  - **ONE MEB equals 15 ships (5 Big Decks, 5 LPD-17's and 5 LSDs)**
  - **Two MEBs = 30 Ships**
- **AE Lift Competes with Presence Ops:**
  - **Maritime Missions (5th Flt)**
  - **Normal MEU Deployments**
  - **Theater Security Engagement**

5 Big Deck estimate didn't include LHA(R)

Data that determined this ship mix was a pre-OIF equip set (no armor or other emergent equipment considered). JLTV, EFV and other future equipment sets will further challenge lift.

Can we deploy a MEB in total from one coast?

Key is that we must be able to aggregate forces on the front end to meet deployment requirements.

Consider the following:

-One East Coast ESG Deployed: 3 ships

-One West Coast ESG Deployed: 3 ships

-FDNF Sasesebo: 4 ships

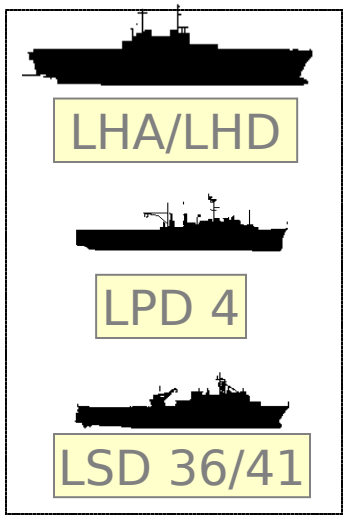
-Notional Maritime mission/TSC: 2 ships

-Ships in maintenance: 3 ships

Amphibious Fleet Transformation

Operations from 1- 5 miles off beach → **Based Operations from 25+ miles**

1990



First Class Warships

Enable Operational Maneuver From The Sea and Ship To Objective Maneuver

STS Mobility Triad Status

Enhanced Capabilities:

- **Seabasing Platforms**
- **LCAC, EFV**
- **MV-22, JSF**
- **Improved Self-Defense**
- **Improved C4I**

2015

Current Amphib Ship Inventory

- **We do not currently meet the stated 30 Ao 2.0 MEB Lift Requirement.**
  - **Only 31 ships and includes Legacy LHA-1s and LPD-4s.**
- **Current amphibious shipping experiencing weight and stability concerns. Over 70% of amphibious ships have been assigned a stability restriction.**
- **C4 and space modernization issues.**
- **ESG office and habitability space concerns.**
- **LHA-1's aren't programmed to receive any JSF ship alts.**

Amphibs
East Coast /Atlantic

- **NASSAU (LHA 4)**
- **WASP (LHD 1)**
- **KEARSARGE (LHD 3)**
- **BATAAN (LHD 5)**
- **IWO JIMA (LHD 7)**
- **NASHVILLE (LPD 13)**
- **PONCE (LPD 15)**
- **SAN ANTONIO (LPD 17)**
- **MESA VERDE (LPD 19)**
- **WHIDBEY ISLAND (LSD 41)**
- **FT MCHENRY (LSD 43)**
- **GUNSTON HALL (LSD 44)**
- **ASHLAND (LSD 48)**
- **CARTER HALL (LSD 50)**
- **OAK HILL (LSD 51)**

Atlantic Fleet Inventory:

-4 LHD

-1 LHA

-2 LPD-4

-2 LPD-17

-4 LSD-41

-2 LSD-49

15 Total Amphib Ships

Amphibs
West Coast/Pacific

- **TARAWA (LHA 1)**
- **PELELIU (LHA 5)**
- **ESSEX (LHD 2) ***
- **BOXER (LHD 4)**
- **BONHOMME RICHARD (LHD 6)**
- **CLEVELAND (LPD 7)**
- **DUBUQUE (LPD 8)**
- **DENVER (LPD 9)**
- **JUNEAU (LPD 10) ***
- **USS NEW ORLEANS (LPD 18)**
- **GERMANTOWN (LSD 42)**
- **COMSTOCK (LSD 45)**
- **TORTUGA (LSD 46) ***
- **RUSHMORE (LSD 47)**
- **HARPERS FERRY (LSD 49)***
- **PEARL HARBOR (LSD 52) Sasebo**

Pacific Fleet Inventory:

-3 LHD

-2 LHA

-4 LPD-4

-1 LPD-17

-4 LSD-41

-2 LSD-49

16 Total Amphib Ships

***FDNF –**

Shipbuilding/Procurement

- **LHD 8 MAKIN ISLAND Deliver FY09**
- **LPD 20 GREEN BAY Deliver Oct 08**
- **LPD 21 NEW YORK Deliver Jun 09**
- **LPD 22 SAN DIEGO Deliver Aug 10**
- **LPD 23 ANCHORAGE Deliver Feb 11**
- **LPD 24 ARLINGTON Deliver Aug 11**
- **LPD 25 SOMERSET Deliver Oct 11**

Updated as of May 2008

Commissionings are scheduled approximately 3 months after delivery.

Big Deck Program

- **LHD-8 Makin Island**
- **LHA-6**
- **LHA-7 and LHA-8 in MPF(F) or AE?**
- **LHA-9**
- **LHD(X)**

LHD-8 MAKIN ISLAND

- LHD 8 to be assigned to West Coast.
- Start of Construction: 22 May 03
- Christening Ceremony 19 Aug 2006
- Delivery Date plagued by delays; should of delivered last year. Katrina and Union Delays were causes for delay. Latest delay is massive wiring discrepancy throughout platform. New delivery date is second quarter of 2009 (Spring/ Summer 2009)
- Major changes: Elimination of steam through the introduction of gas turbine

LHA Replacement

- **The last of the four TARAWA class LHAs reach the end of it's service life in 2015***
- **LHA(R) program originally developed to replace remaining LHA-1 Class Ships (4 ship build)**

Concepts and Programs "Refining the program of record to a more affordable platform with maximum warfighting capability."

LHA-6 (LHA(R)) Take Aways?

- **Increased Aviation Capabilities**
  - **MV-22 / JSF**
  - **Maint Capability (2 Maint Hi Hat Areas)**
  - **Fuel**
- **No Well Deck**
  - **Limited to Vertical Lift Items Only**
  - **May increase reliance on CH53 for external lifts**
- **Decrease SQFT (vertical lift only items)**
- **Decreased Medical Capability**
- **Prelimenary analysis shows that this platform works well in an MCO (MEB) scenario; however, limits operational flexibility in an LCO and MEU/ESG deployment scenario.**

Latest on LHA (R)

2009 Shipbuilding Plan

- **LHA-6 slated for the AE.**
  - **FY06/FY07 Procurement (split funded)**
- **LHA-7 and LHA-8 slated for MPF(F) ****
  - **LHA-7 FY10 Procurement**
  - **LHA-8 FY14 Procurement**
- **LHA-9 slated for the AE.**
  - **LHA-9 FY17 Procurement**

POM-10 Draft Latest USN Perspective

- **All LHA-6 Class assigned to AE**

Pros:

-Provides modern big decks to replace legacy LHA-1 Class Ships.

Cons:

-Leaves MPF(F) without new shipbuild big decks.

-LHA-6 and LHA-7 will not have well decks.

USMC standing up Well Deck Analysis Working Group to provide analytical requirements to install the well deck into LHA-8 and LHA-9. Well Deck Analysis to be completed by Nov 2008. Stakeholders: CD&I, PP&O, and P&R.

LPD-17 Program Highlights

- **3 of programmed 9 ships have been delivered.**
- **USMC Requirement is 11 LPD-17 Ships.**
- **Congress (HASC) favorably views requirement for 10th and 11th LPD-17s.**
- **10th LPD-17 was the USMC's #1 unfunded priority.**
- **Some working shipbuilding budgets reflect the procurement of the 10TH LPD-17 if supplemental is received.**

LPD 17 Lead Ship Snapshot

- **USS SAN ANTONIO (LPD-17)**
- **LPD-17 Commissioned and Homeported at Norfolk, VA.**
- **Delivered uncompleted.**
- **Post Shake Down Availability during summer 07 to complete unfinished work and discrepancies noted during INSURV earlier this Spring.**
- **OPEVAL scheduled for Early 08.**
- **Scheduled to deploy in 2008.**

LPD-17 Completed OPEVAL Mar 2008

- **USS NEW ORLEANS (LPD-18)**
- **Delivered uncompleted.**
- **Availability during summer 07 to complete unfinished work.**
- **Currently conducting CSQT in Hawaii.**

- **USS MESA VERDE (LPD-19)**
- **Commissioned Dec 15, 2007 (Panama City, FL)**
- **Delivered completed.**
- **Homeported in Norfolk, VA**

Original LPD-17 Program quantity was 12; currently on 9 ships in the shipbuilding plan.

LPD 4 - LPD 17 Transition

(As of 27 July 2007)

- **Extended Sustainability**
- **LPD 17 Class delivery dates**

	FMS	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11	FY
LPD 4 AUS		1	1	Decom						
LPD 5 OGD	YES	1	1	1	Decom					
LPD 6 DUL		1	Decom							
LPD 7 CLE		1	1	1	1	1	1	Decom		
LPD 8 DUB		1	1	1	1	1	1	1	1	Dec
LPD 9 DEN		1	1	1	1	1	1	1	1	
LPD 10 JUN		1	1	1	1	1	Decom			
LPD 12 SHR		1	1	1	Decom					
LPD 13 NAS		1	1	1	1	1	Decom			
LPD 14 TRE	YES	1	1	1	Decom					
LPD 15 PON		1	1	1	1	1	1	1	1	Dec
LPD 17 SAN			1	1	1	1	1	1	1	
LPD 18 NOR					Dec06	1	1	1	1	
LPD 19 MVD					Sep07	1	1	1	1	
LPD 20 GBY						Aug08	1	1	1	
LPD 21 NYK							May09	1	1	
LPD 22 SDG								Jun10	1	

LPD-17
Take Aways

- **Increased Aviation Maint Capacity**
  - **Hangar Bay**
- **Increased Surface Asslt Capacity**
  - **2 LCACs vice 1 LCU w/LPD-4 Class**
- **Increased SQFT Capacity (almost double LPD-4)**
- **Increased Medical Capability**
- **Berthing / Pax Traversing Considerations**
- **MOGAS Issues**

LSDs

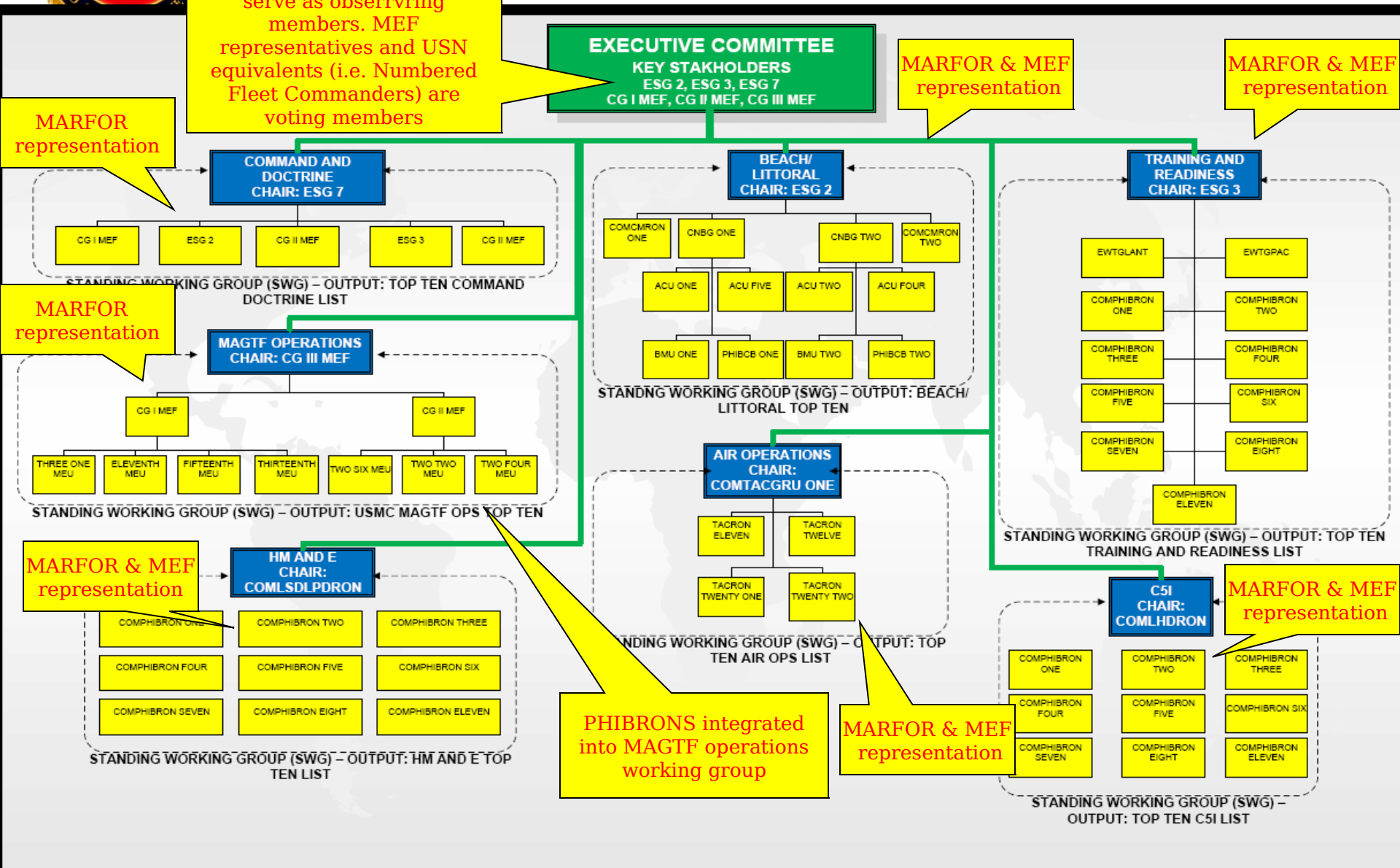
- **Current inventory is 12 LSDs (8/4)**
- **HQMC and OPNAV looking at moving LSD(X) procurement to the left.**
- **Optimally, looking to use the LPD17 hull form.**
  - **Doing so may realize cost savings for program**
- **Contractor could possibly keep production line "Hot" using LCC(R) as a bridge.**
  - **Depends on whether or not LCC(R) uses LPD17 hull form and if we can procure the additional (10th and 11th) LPD-17s.**

MAGTF OPS Working Group

Top Ten List

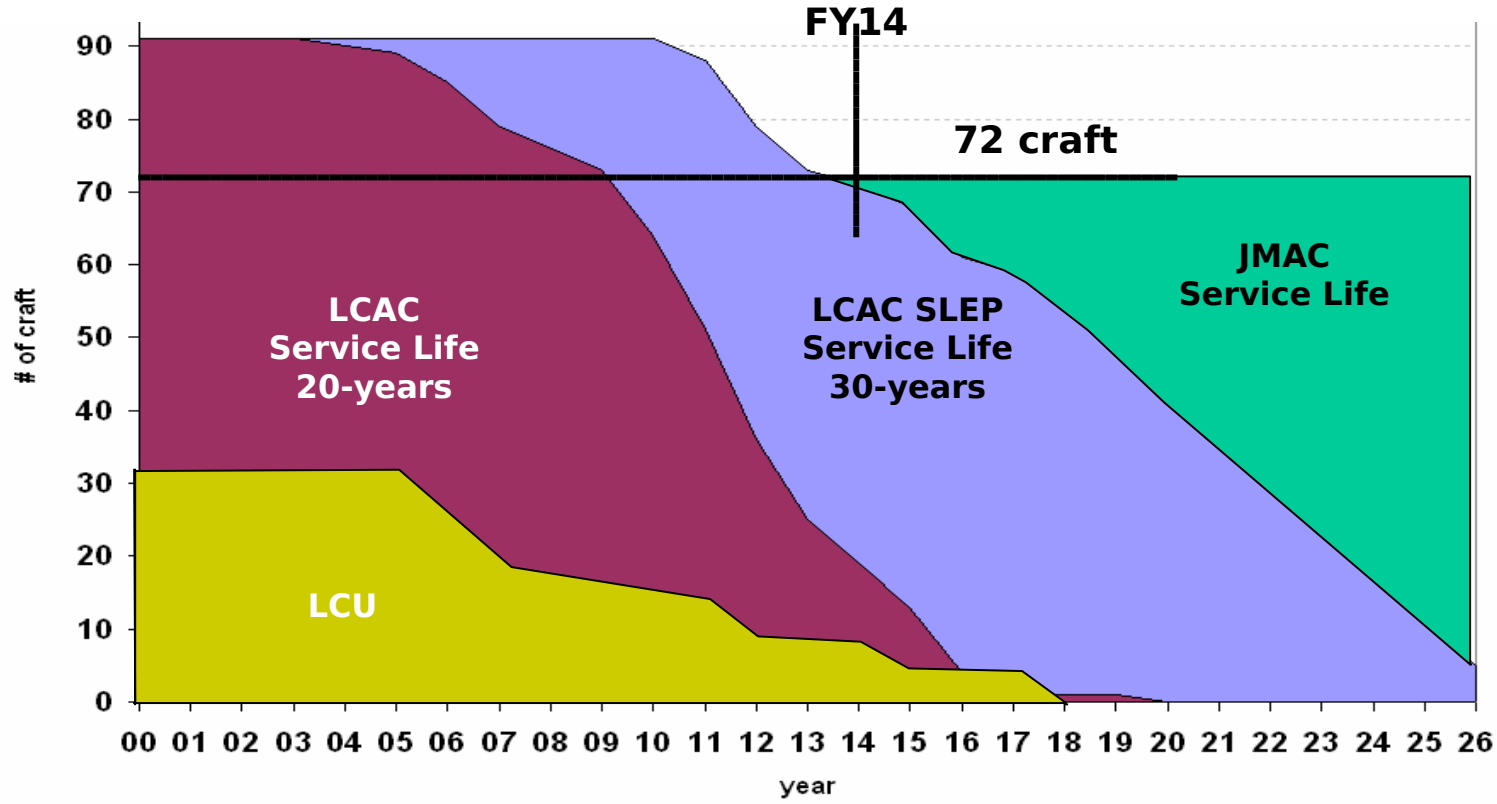
1. ESG VS PHIBGRU
2. LARGE SCALE EXERCISE LSE
3. L-CLASS SHIP MAINT FUNDING
4. HF ALE INTEGRATION / SAR
5. CLSM/ EMUT ANTENNA INSTALLMENT
6. DIGITAL SATCC
7. CBSP
8. GIG E INSTALLS
9. ESG/MEU SPACE INTEGRATION AND STANDARDS
10. LCU REPLACEMENT

Recommendations to AMW OAG SWGs



Ship to Shore Connector (Joint Maritime Assault Craft)

- JMAC required to fill future gaps that the end of LCAC and LCAC SLEP Service Life will create
  - Key to future Joint surface assault and sustainment



Studies and Analysis

- **Ship Stability Weight and Moment Study**
- **Amphibious Assault Ship Well Deck Analysis**
- **NSE Organizational Structure ISO MCO – N81**
- **Air Cushioned Vehicle SSC Requirements Study for AE and MPF(F) – N81**
- **Evaluation of Alternate MPF(F) Squadron Composition Impact on Loads in LMSR and Offloadability Study – N81**
- **Mobility Capabilities Requirements Study (DOD)**

Amphibious Programs

Program Overview
LCAC SLEP

BUOYANCY BOX REFURBISHMENT

- Addresses Corrosion Problem
- 20-Year Service Life
- Incorporates Hull Upgrades and

ROTATING MACHINERY REFURBISHMENT

- Extends Useful Life of Equipment
- Reduces Maintenance

ENHANCED ENGINES

- Provides Additional Power
- Reduces Fuel Consumption
- Reduces Maintenance

C4N REPLACEMENT

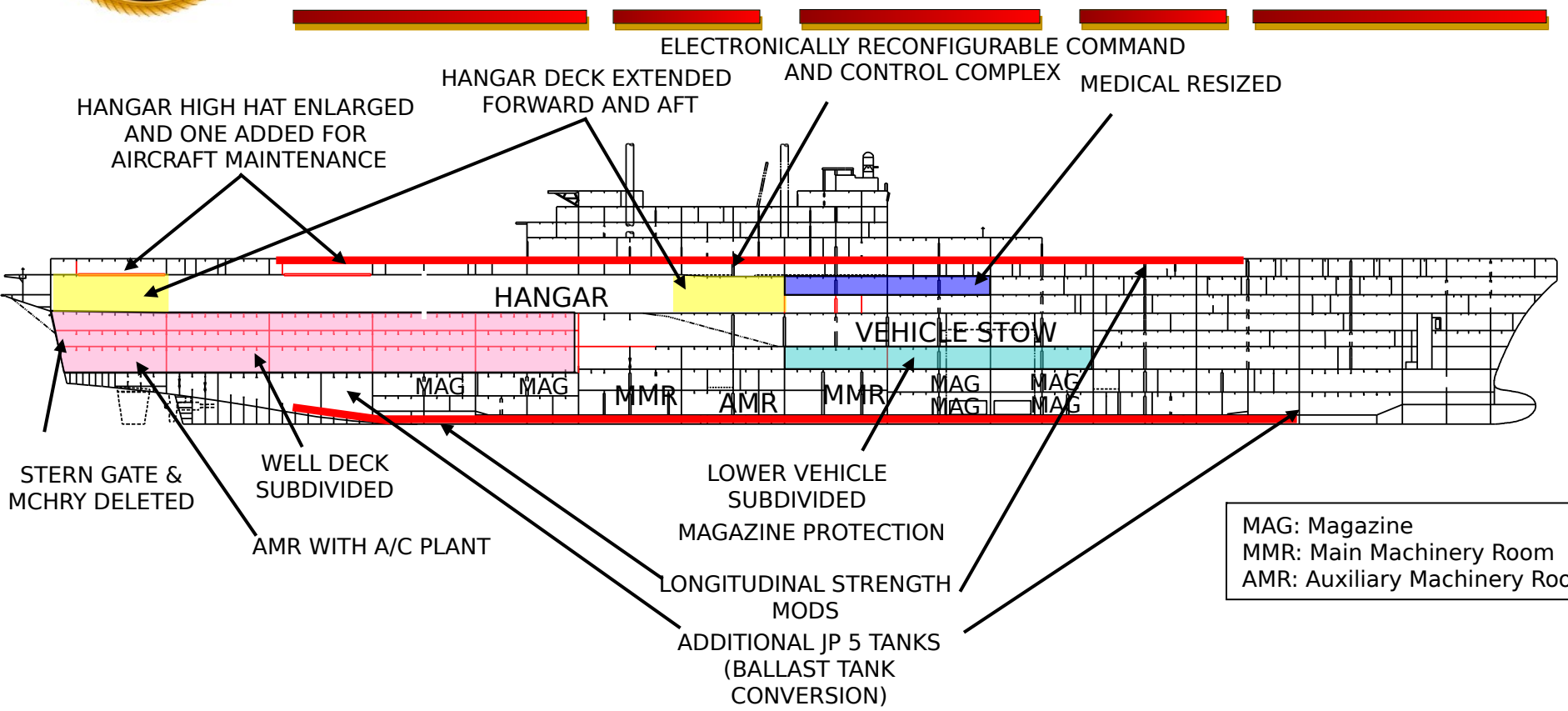
- Introduces Open Architecture
- Introduces Modern COTS Equipment
- Provides Precision Navigation
- Provides Common Tactical Picture
- Provides Comm Suite Interoperability

DEEP SKIRT

- Reduces Drag
- Increases Performance Envelope
- Reduces Maintenance
- Increases Obstacle

Backups

LHA 6 Design



- Increased aircraft spotting factors for future Marine Corps aircraft as well as larger logistic footprint required hangar deck expansion and subsequent relocation of AVCAL (aviation test equipment, tools, parts etc.) and maintenance shops to the former well deck area
- Removal of well deck allowed for increased aviation fuel capacity through conversion of ballast tanks to JP-5 tanks

Capability Comparison
LHA vs. LHD vs. LHA(R)

Requirements	LHA	LHD	LHA(R) **(LHA 6)**
Aviation: JSF	**0**	**19**	**23**
Aviation Maint (MV22)	**Limited**	**Limited**	**Full (2 MV22)**
Cargo (K cubic ft)	**109**	**125**	**160**
Vehicle (K square ft)	**25.4**	**20.9**	**11.6**
Troops	**1,713**	**1,686**	**1,686**
Well Deck Spots (LCAC)	**1**	**3**	**0**
JP-5 (K gallons)	**400**	**617**	**1,300**
Sustained Speed (kts)	**22**	**22**	**22**
Survivability (armor)	**None**	**Limited**	**Add'l**

CAPABILITY VALIDATED BY JROC ON FEBRUARY 8, 2005

JROCM validated revised aviation, survivability and force protection KPPs on December 19, 2005

LHA (R)Description

- **Mission**
  - **Amphibious Assault with Aviation Focus**
    - **9 Landing Spots**
    - **Supports tilt –rotor aircraft, helicopters, and STOVL aircraft**
  - **Support USMC Future Aviation Combat Element (ACE)**
    - **MV 22**
    - **JSF**
- **Description**
  - **Expanded Hangar Bay and aviation support facilities**
    - **Increased aviation fuel capacity**
    - **Increased aviation weapons storage capacity**
    - **Increased stowage for “aviation footprint”**
  - **Deletion of well deck**
  - **Enhanced survivability**
- **Employment**
  - **Provide forward presence and power projection, independently as an integral part of joint, interagency, and multinational maritime expeditionary forces.**

LANDING FORCE OFFICE SPACES BACKGROUND

- **APR 04 – MARFORLANT SUBMITTED LHD C2I SPACE CONFIG CONF**
- **OCT 05 – SCD-187 APPROVED TO ADDRESS MARFORLANT C2I RECOM**
- **APR 06 – 26 MEU MAGTF SPACE UPGRADES FOR BATAAN ESG**
- **JUN 06 – MARFORCOM ENDORSEMENT OF 26 MEU SPACE UPGRADES**
- **AUG 06 – 22 MEU ASSESSMENT OF AMPHIB SHIPPING**

DEMAND SIGNALS FOR PROCESS

DEVELOPING THE BASELINE

- **IN ORDER TO AFFECT CHANGES / MODIFICATIONS, A UNIFORM STANDARD MUST BE DEVELOPED AND SCD'S SUBMITTED.**
  - **Develop an Interim Policy for approval of ship modification/change requests.**
  - **Staff the Baseline.**
  - **Incorporate Baseline into SCDs.**
  - **Provide a Process on how to incorporate future required capabilities into SCDs.**

THE WAY AHEAD WILL INCORPORATE SCD'S FOR EACH SHIP CLASS

EVOLUTION OF EQUIPMENT

- _-M151 Jeep W/M416 Tlr (WT:2960 LBS)
- M998 HMMWV 1/1/4 T Trk(~6000 lbs)
- M998 HMMWV w/ MAK Armor (10,500 lbs)
- -M48 Tank (104K lbs)
- M60 Tank (113,200 lbs)
- M1A1 Tank (138K lbs)
- -CH46A (13K lbs)
- CH46E (15.5K lbs) (Basic/Empty)
- MV22 (33K lbs) (Basic/ Empty)
- -CH53A (23K lbs)
- CH53D (23K lbs)
- CH53E (49K lbs)
- ARMOR IMPACT
- -MTVR with armor: ~10K lbs additional wt.
- -HMMWV with armor: ~3K lbs additional wt.

MEU EQUIPMENT

- **MEU EQUIPMENT**
- **Current operations in the CENTCOM AOR have resulted in a program of up-armoring of almost all vehicles in the MEU. This program of up-armoring has resulted in the following challenges:**
- **Weight: The significant increase in vehicle weight has led to concerns to ship's stability and draft capacities.**
- **Space: The "up-armored" vehicles are larger than their unarmored counterparts and thus change the dynamic of ship loading.**
- **Crossing the beach: The weight of the new vehicles has made surf passages problematic. Off-load of vehicles is restricted to LCU ramps and LCAC.**
- **Solutions:**
  - **MEU enhancement package: Designed to provide up-armored vehicles to allow a MEU to operate in the CENTCOM AOR**
  - **Selected use of "Black-Bottom" shipping to move "excess" vehicles and equipment to projected employment areas (specifically CENTCOM AOR).**

Overview LHD 7 vs LHD 8

LHD 7

LHD 8

• Propulsion	2 Steam Turbines (70K HP total) 2 Boilers	2 Gas Turbines (70K BHP total) 2 Auxiliary Prop. Motors (10K BHP total)
• Electric Generation	5 SSTGs, 2.5 MW each 2 EDGs, 2.0 MW each	6 SSDGs 4.0 MW each
• Electrical Distribution	450 VAC, Radial	4160/450 VAC, Zonal
• Water Desalinization	2-100,000 GPD Evaporators	4-50,000 GPD RO Units
• Auxiliaries	Steam/Electric	All Electric
• Machinery Control LAN	Local Control/Copper Wire	Central Control System/Fiber Optic
• MMR Fire Protection	HALON 1301	Water Mist

Comparison With Existing Amphibs

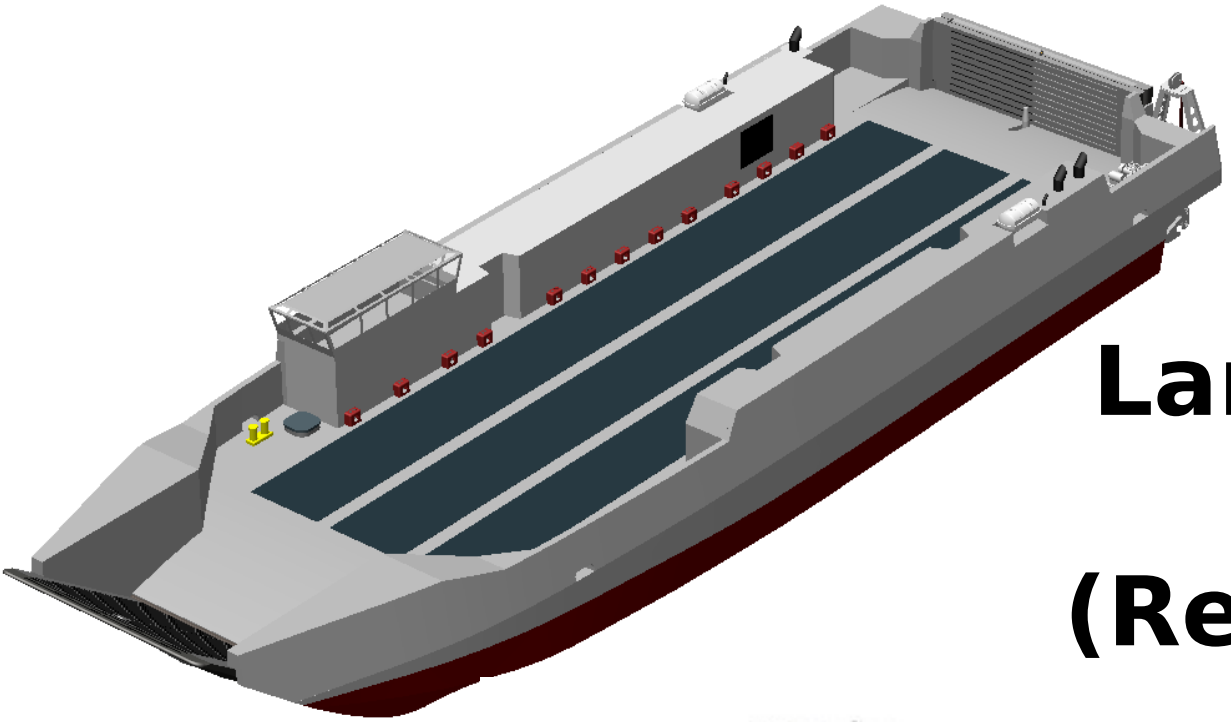
	LPD 17	LPD 4	LHD1	LHA
LENGTH (FT)	684	570	844	820
BEAM (FT)	105	84	106	106
FULL LOAD DRAFT (FT)	23	23	26.7	26.7
FULL LOAD DISPL. (LT)	24,900	16,905	40,538	39,400
PROPULSION PLANT	DIESEL	STEAM	STEAM *	STEAM
SUSTAINED SPEED (KTS	22	21	22	22
VEHICLE SQUARE (FT^2)	25K	11.8K	20.9K	25.4K
CARGO VOLUME (FT^3)	34K	38.3K	125K	105.9K
TROOPS	720	788	1,687	1,710
LCAC	2	1	3	1
LANDING SPOTS	4	2	9	10
CREW	361	420	1,247	1,204
MEDICAL CAPABILITY	24 BEDs/2 ORs	12 BEDs/1 OR	64 BEDs/6 ORs	18 BEDs/ 6ORs
MOGAS CAPABILITY (GAL)	10,000**	22,300	0	9,000

- LHD 8 will have gas turbine propulsion.
- LPD-17 MOGAS reduced to 3000

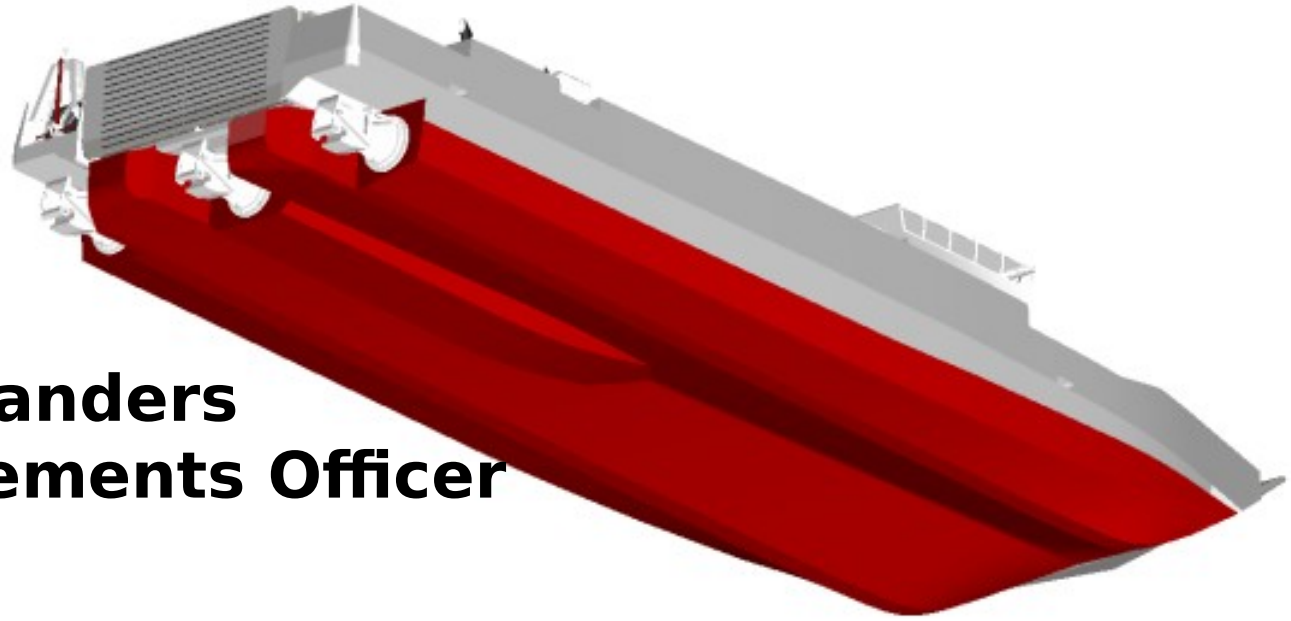
LCAC Systems Upgrade & LCAC SLEP

- Systems Upgrade
  - Rapidly replace obsolete equipment: Radios and Radars
    - Responsible for 67% craft down CASREPS
  - Deep Skirt
  - Corrosion Abatement

System Upgrade = 3-4 Months | SLEP = 9-12 Months



Landing Craft Utility (Replacement)



LCDR Eric Sanders
NSE Requirements Officer

Why an LCU(R)

- **Current craft 12 – 24 yrs past ESL**
- **Performance and readiness degrading with age**
- **Current LCU wastes Well Deck space**
- **Current LCU is subject to broaching due to poor maneuverability**
- **Communications suite outdated and non-interoperable**

Katrina Shipbuilding Impact

LPD HULL	PRE-STORM DELIVERY	POST-STORM DELIVERY
LPD-17	07/05	NO IMPACT
LPD-18	1/06	12/06
LPD-19	03/06	03/07
LPD-20	10/06	12/07
LPD-21	8/07	04/08
LPD-22-25	NOT PROGRAMMED	NO IMPACT
LHD-8	7/07	Mid-08